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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/386,847	08/31/1999	SHIGEKI WATANABE	837.1209/JDH	1867

21171 7590 05/23/2003

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EXAMINER

MOONEY, MICHAEL P

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 05/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

*Supplemental*  
**Notice of Allowability**

Application No.

09/386,847

Examiner

Michael P. Mooney

Applicant(s)

WATANABE, SHIGEKI

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-19, 21-26 and 34-40.
3. ☒ The drawings filed on 31 August 1999 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____             |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____               | 6 <input type="checkbox"/> Examiner's Amendment/Comment                             |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
|  | 9 <input type="checkbox"/> Other  |

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It is regretted that the PTO-37 "Notice of Allowability" form of paper no. 8 mistakenly indicates that claims 27-33 are allowed. In the same paper no. 8, these claims were correctly cancelled by Examiner's amendment.

The "Supplemental" Notice of Allowability enclosed infra has been corrected.

### REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The reasons for allowance for unmodified claims 1-13 are as stated in the prior Office action, i.e., paper no. 6.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising first and second optical networks, the converter comprises:

an optical circulator having 1<sup>st</sup> 2<sup>nd</sup> and 3<sup>rd</sup> ports, 1<sup>st</sup> port being supplied with signal light including 1<sup>st</sup> and 2<sup>nd</sup> polarization components respectively having 1<sup>st</sup> and 2<sup>nd</sup> polarization planes (PPs) orthogonal to each other and with the pump light;

a polarization beam splitter (PBS) having 4<sup>th</sup> 5<sup>th</sup> and 6<sup>th</sup> ports said 4<sup>th</sup> port being optically connected to the 2<sup>nd</sup> port; said 4<sup>th</sup> and 5<sup>th</sup> ports being optically coupled by said 1<sup>st</sup> PP, said 4<sup>th</sup> and 6<sup>th</sup> ports being optically coupled by said 2<sup>nd</sup> PP; and

a PMF having 1<sup>st</sup> and 2<sup>nd</sup> ends...first end being optically connected to said 5<sup>th</sup> portso that said 1<sup>st</sup> PP is adapted to the polarization mode (PM), said 2<sup>nd</sup> end being optically connected to said 6<sup>th</sup> port so that the 2<sup>nd</sup> PP is adapted to said PM in combination with the rest of claim 14 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

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The prior art, either alone or in combination, does not disclose or render obvious a device comprising a PMF, 1<sup>st</sup> end connected to the 2<sup>nd</sup> port and second end connected to the 3<sup>rd</sup> port, etc. in combination with the rest of claim 34 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light, wherein the signal light is WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths and arranged at unequal intervals in combination with the rest of claim 35 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light,

wherein when each of the 1<sup>st</sup> and 2<sup>nd</sup> fiber spans is virtually divided into the same number of sections, the product of the average (PoA) of CDs of a 1<sup>st</sup> one of the sections of the first fiber span and the length of the 1<sup>st</sup> one is substantially equal to the product of the average (PoA) of CDs of a 2<sup>nd</sup> one of the sections of the first fiber span and the length of the 2<sup>nd</sup> one, said 1<sup>st</sup> and

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2<sup>nd</sup> ones corresponding to each other in order as counted from the converter, and the PoA of OPs in the 1<sup>st</sup> one, the average of NLCs in 1<sup>st</sup> one and the length of the 1<sup>st</sup> one is substantially equal to the PoA of OPs in the 2<sup>nd</sup> one, the average of NLCs in 2<sup>nd</sup> one and the length of the 2<sup>nd</sup> one in combination with the rest of claim 36 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light, wherein:

the ratio of the product of an optical power (OP) and a NLC to a chromatic dispersion (CD) at a 1<sup>st</sup> point on the 1<sup>st</sup> fiber span is substantially equal to the ratio of the product of an optical power (OP) and a NLC to a chromatic dispersion (CD) at a 2<sup>nd</sup> point on the 2<sup>nd</sup> fiber span; and

an accumulated value of CDs measured from the converter to the 1<sup>st</sup> point being equal to an accumulated value of CDs measured from the converter to the 2<sup>nd</sup> point in combination with the rest of claim 37 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

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a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light, wherein:

the ratio of the product of an optical power (OP) and a NLC to a chromatic dispersion (CD) at a 1<sup>st</sup> point on the 1<sup>st</sup> fiber span is substantially equal to the ratio of the product of an optical power (OP) and a NLC to a chromatic dispersion (CD) at a 2<sup>nd</sup> point on the 2<sup>nd</sup> fiber span; and

an accumulated value of the products of OPs and NLCs measured from the converter to the 1<sup>st</sup> point being equal to an accumulated value of the products of OPs and NLCs measured from the converter to the 2<sup>nd</sup> point in combination with the rest of claim 38 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light; wherein the product of the average of CDs of the 1<sup>st</sup> fiber span and the length of 1<sup>st</sup> fiber span is substantially equal to the product of the average of CDs of the 2<sup>nd</sup> fiber span and the length of 2<sup>nd</sup> fiber span in combination with the rest of claim 39 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

The prior art, either alone or in combination, does not disclose or render obvious a system comprising 1<sup>st</sup> and 2<sup>nd</sup> WDM optical fiber networks (OFNs);

a converter connected between the 1<sup>st</sup> and 2<sup>nd</sup> OFNs, the converter converting signal light into converted signal light by nonlinear optical effect based on the signal light and pump light;

and the PoA of OPs in the 1<sup>st</sup> fiber span, the average of NLCs in 1<sup>st</sup> fiber span and the length of the 1<sup>st</sup> fiber span is substantially equal to the PoA of OPs in the 2<sup>nd</sup> fiber span, the average of NLCs in 2<sup>nd</sup> fiber span and the length of the 2<sup>nd</sup> fiber span in combination with the rest of claim 40 for the reasons argued by applicant in the Remarks in the Amendment filed on 3/18/03.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

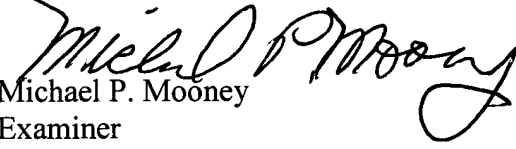
### ***Conclusion***

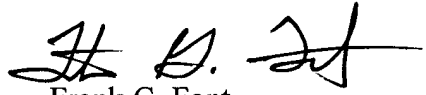
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 703-308-6125. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 703-308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956. An alternative useful number for status inquiries is 703-306-3329.

  
Michael P. Mooney  
Examiner  
Art Unit 2877

  
Frank G. Font  
Supervisory Patent Examiner  
Art Unit 2877

FGF/mpm  
5/21/03